
Science Flight Report

Operation IceBridge Antarctica 2010



Flight: F06
Mission: Dotson 01

Flight Report Summary

Aircraft	DC-8 (N817NA)
Flight Number	110111
Flight Request	118003
Date	Saturday, November 06, 2010 (Z), Day of Year 310
Purpose of Flight	Operation IceBridge Mission Dotson 01
Take off time	13:07:44 Zulu from Punta Arenas (SCCI)
Landing time	23:41:37 Zulu at Punta Arenas (SCCI)
Flight Hours	10.7
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	<ul style="list-style-type: none">• Low-altitude survey (1,500 ft AGL) of Dotson Ice Shelf.• Completed entire mission as planned.• ATM, MCoRDS, Snow and Ku-band radars, gravimeter, LVIS, POS/AV, and DMS were operated on the survey lines.• Conducted a ramp pass at Punta Arenas airport for ATM, LVIS and DMS instrument calibration (1,200 ft AGL).• Conducted pitch and roll maneuvers for LVIS calibration over Drake Passage and Strait of Magellan.
Geographic Keywords	Antarctica, Dotson Ice Shelf, Thwaites Glacier, Pine Island Bay, Marie Byrd Land, Smith Glacier, Kohler Glacier, Bear Peninsula, Abbott Ice Shelf.
ICESat/CryoSat Track	ICESat tracks 0235, 0354
Repeat Mission	None.

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	40 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1 TB	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	185 GB	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	185 GB	None
LVIS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	80 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	40 GB	None
POS/AV (510 + 610)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 GB	None
Gravimeter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	80 MB	None
DC-8 Onboard Data	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	40 MB	MIL-STD-1553 card failure.

Mission Report (Michael Studinger, Mission Scientist)

Today's mission is a new design. It is intended to map the Dotson Ice Shelf and the bathymetry of the cavity beneath the floating ice tongue, using the gravimeter supplemented by radar and altimetry measurements. The grid lines are mostly spaced at 10 km apart. However, we have aligned the grid along the ICESat tracks in the area and replaced two of the 10 km grid lines with ICESat tracks, so the grid is not perfectly uniform as a result.

The weather in the survey area was what we had expected from the forecast. We aimed at a small weather window over the Dotson and Crosson Ice Shelves and decided to fly the Dotson Mission because the forecast was slightly better than for Crosson. This turned out to be the right decision, since medium level clouds covered most of the high topography of the Crosson survey area and flying this mission would have been very difficult to impossible. Over Pine Island Bay we encountered dense fog that we had expected from the weather forecast. The flow of relatively warm air from the inland created fog over open water and sea ice in the bay. The dense fog cleared instantly when we reached the ice shelf at the beginning of our survey line at waypoint T370. The fog stayed offshore and did not affect our survey just as we had hoped. The clouds further inland were right at the inland edge of our survey area and did not pose a problem either. We have been flying in a small weather window, cornered in between fog on the sea side and clouds on the inland side, which worked out fine.

During the turn between waypoints X2E and 60N we stayed 10 nautical miles away from the newly discovered penguin colony on Bear Peninsula.

The pilots did a great job today staying at 1,500 ft AGL which greatly helped collecting good snow and Ku-band and MCoRDS data.

Our transit route from the survey area back to Punta Arenas crossed the western edge of the Abbott Ice Shelf. We flew over the rift in the Abbott Ice Shelf during the high-altitude return transit to accommodate a request from the British Antarctic Survey to gather topographic data over the rift. The area was completely obscured by clouds during the pass and we did not get usable elevation data on this target of opportunity.

All instruments worked well and we recorded good data on this flight. In addition to the survey lines we were able to collect brief segments of LVIS and DMS data over small cloud free areas over sea ice in the Bellingshausen and Amundsen Seas.

Individual instrument reports from experimenters on board the aircraft:

ATM: Both ATM system worked well and collected good data along the entire survey line.

MCoRDS: The MCoRDS radar worked well and collected 1 TB of data.

Snow and Ku-band radar: Worked well. The pilots did a great job staying very close to 1,500 ft AGL all times which greatly helped collecting good data.

Gravimeter: Worked well. No issues.

DMS: DMS worked well and collected 6889 images on today's flight.

LVIS: The LVIS system worked very well. The system collected data on the inbound and outbound transits and collected narrow swath data over the low-altitude survey lines.

POS/AV: Systems worked well. No issues.

DC-8 on board data: The MIL-STD-1553 card in the REVEAL data system, which records the radar altimeter data, failed during flight after waypoint X2. The failure caused the REVEAL text parameter display page to freeze for the remainder of the flight. Only the display was impacted and the REVEAL system was still recording data during the flight. The card will be replaced before the next flight.

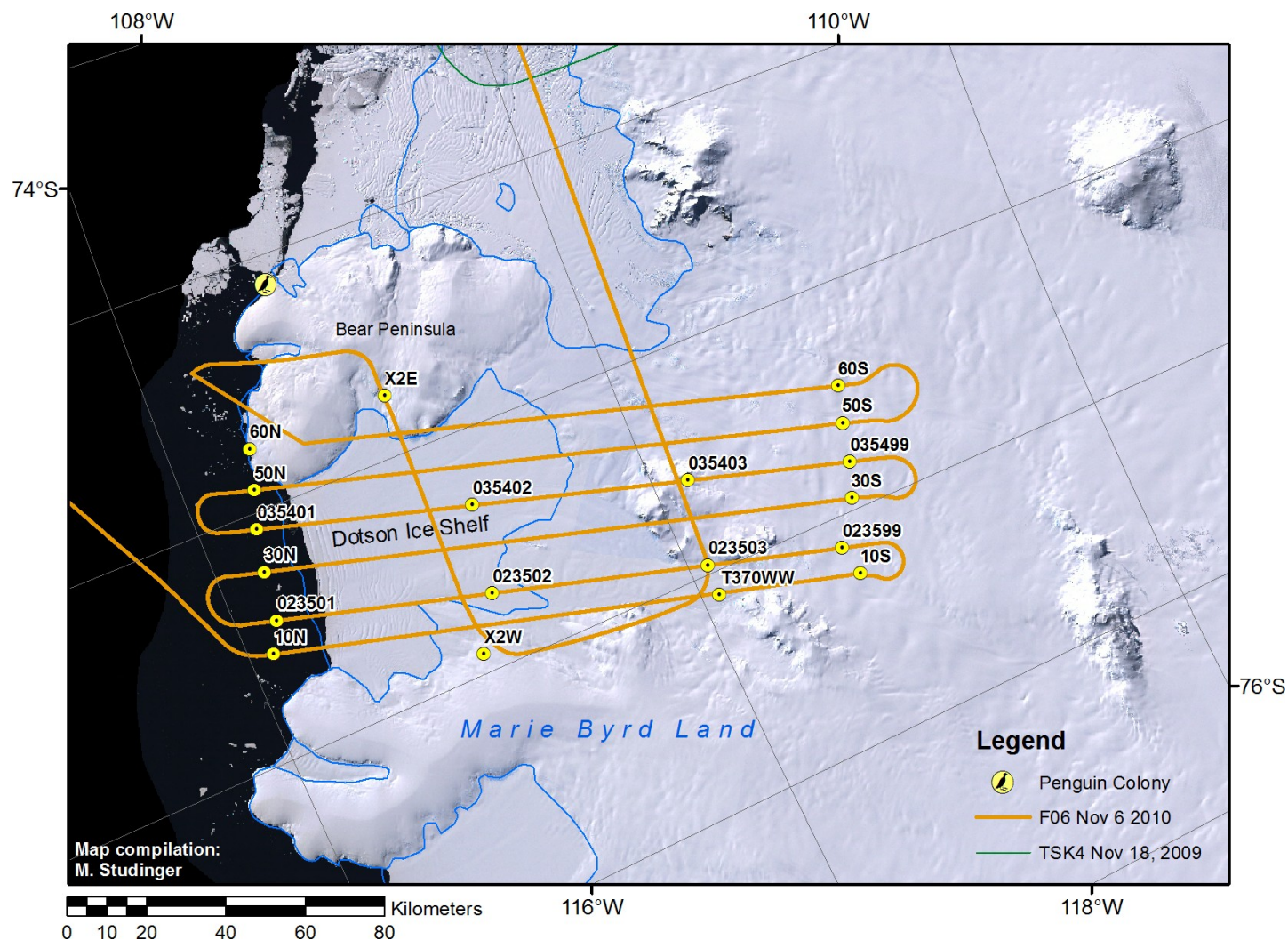


Figure 1: Flight path of today's mission over the Getz Ice Shelf.